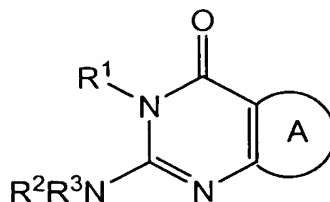


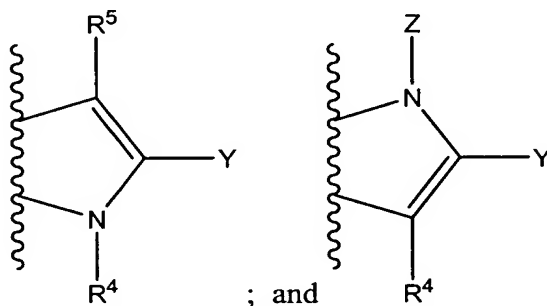
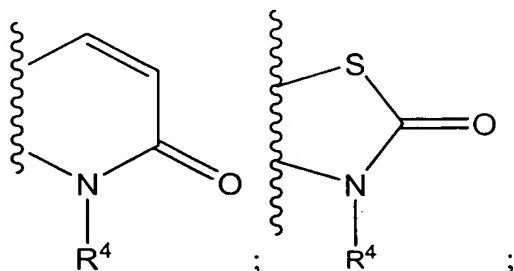
WHAT IS CLAIMED IS:

1. A compound having the formula:



wherein

R¹, R² and R³ are members independently selected from H, substituted or unsubstituted alkyl, substituted or unsubstituted heteroalkyl, substituted or unsubstituted aryl, substituted or unsubstituted heteroaryl and substituted or unsubstituted heterocycloalkyl; and ring system A is a member selected from:



wherein

Z is substituted or unsubstituted alkyl;

Y is a member selected from H, halogen, nitro, and nitroso;

R⁴ is selected from H, substituted or unsubstituted alkyl, substituted or unsubstituted heteroalkyl, and a carrier moiety; and

R^5 is a member selected from H, CN, OR^{12} , $C(X^1)OR^{12}$,
 $C(X^1)NR^{13}R^{14}$, $NR^{15}R^{16}$, SR^{12} , NO, halogen, substituted or
unsubstituted C_1 - C_6 alkyl and substituted or unsubstituted C_1 -
 C_6 heteroalkyl

wherein

R^{12} is a member selected from H, substituted or unsubstituted
 C_1 - C_6 alkyl, substituted or unsubstituted C_1 - C_6
heteroalkyl and $C(O)R^{17}$

wherein

R^{17} is substituted or unsubstituted C_1 - C_6 alkyl and
substituted or unsubstituted C_1 - C_6 heteroalkyl;

X^1 is a member selected from (=O), (=NH) and (=S);

R^{13} and R^{14} are members independently selected from H,
substituted or unsubstituted C_1 - C_6 alkyl and substituted
or unsubstituted C_1 - C_6 heteroalkyl; and

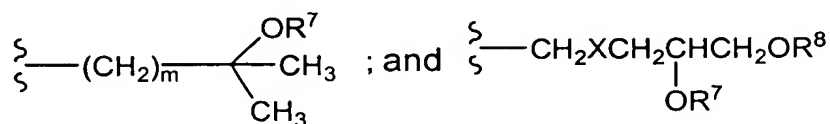
R^{15} and R^{16} are members independently selected from H, O,
substituted or unsubstituted C_1 - C_6 alkyl and substituted
or unsubstituted C_1 - C_6 heteroalkyl, or taken together,
form $C(O)R^{18}$;

wherein

R^{18} is a member selected from substituted or
unsubstituted C_1 - C_6 alkyl and substituted or
unsubstituted C_1 - C_6 heteroalkyl.

2. The compound according to claim 1, wherein R^4 is a member selected
from alkyl substituted with at least one hydroxyl moiety and heteroalkyl substituted with at
least one hydroxyl moiety.

3. The compound according to claim 1, wherein R^4 is a member selected
from:



wherein

m is an integer from 1 to 10;

R⁷ and R⁸ are members independently selected from H and carrier moieties;

X is a member selected from O, S and NR⁶

wherein

R⁶ is a member selected from H, substituted or unsubstituted alkyl,

substituted or unsubstituted heteroalkyl, substituted or

unsubstituted aryl, substituted or unsubstituted heteroaryl and

substituted or unsubstituted heterocycloalkyl.

4. The compound according to claim 1, wherein said carrier moiety is a polymer.

5. The compound according to claim 1, wherein said carrier moiety is essentially non-antigenic in a mammalian subject.

6. The compound according to claim 1, wherein said carrier moiety is a biomolecule.

7. The compound according to claim 6, wherein said carrier moiety is a member selected from a nucleic acid, an amino acid, a peptide, a peptide-amino acid, a saccharide, an antibody, an antigen, a lectin and combinations thereof.

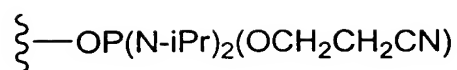
8. The compound according to claim 2, wherein R⁴ is a saccharyl moiety.

9. The compound according to claim 8, wherein said saccharyl moiety is a member selected from substituted or unsubstituted ribofuranose and substituted or unsubstituted deoxyribofuranose.

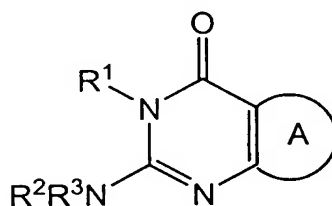
10. The compound according to claim 9, wherein said saccharyl moiety is part of a complex, said complex comprising a member selected from a nucleic acid and a peptide-amino acid.

11. The compound according to claim 1, wherein at least one of R¹, R², R³, R⁴ and R⁵ comprise a phosphoramidite moiety.

12. The compound according to claim 11, wherein said phosphoramidite moiety has the formula:

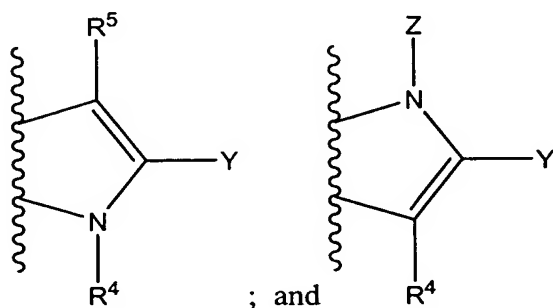
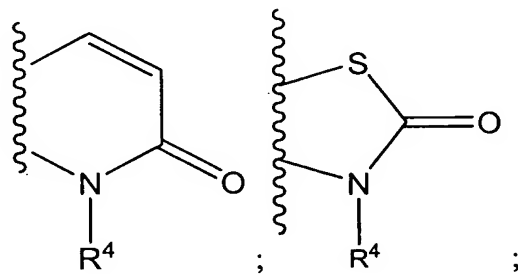


13. A pharmaceutical composition comprising a compound having the formula:



wherein

R¹, R² and R³ are members independently selected from H, substituted or unsubstituted alkyl, substituted or unsubstituted heteroalkyl, substituted or unsubstituted aryl, substituted or unsubstituted heteroaryl and substituted or unsubstituted heterocycloalkyl; and
ring system A is a member selected from:



wherein

Z is substituted or unsubstituted alkyl;

Y is a member selected from H, halogen, nitro, and nitroso;

R^4 is selected from H, substituted or unsubstituted alkyl, substituted or unsubstituted heteroalkyl and a carrier moiety; and

R^5 is a member selected from H, CN, OR^{12} , $C(X^1)OR^{12}$, $C(X^1)NR^{13}R^{14}$, $NR^{15}R^{16}$, SR^{12} , NO, halogen, substituted or unsubstituted C_1 - C_6 alkyl and substituted or unsubstituted C_1 - C_6 heteroalkyl

wherein

R^{12} is a member selected from H, substituted or unsubstituted C_1 - C_6 alkyl, substituted or unsubstituted C_1 - C_6 heteroalkyl and $C(O)R^{17}$

wherein

R^{17} is substituted or unsubstituted C_1 - C_6 alkyl and substituted or unsubstituted C_1 - C_6 heteroalkyl;

X^1 is a member selected from (=O), (=NH) and (=S);

R^{13} and R^{14} are members independently selected from H, substituted or unsubstituted C_1 - C_6 alkyl and substituted or unsubstituted C_1 - C_6 heteroalkyl; and

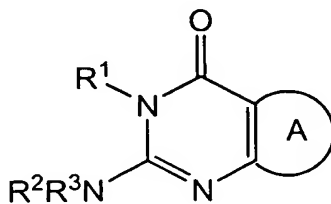
R^{15} and R^{16} are members independently selected from H, O, substituted or unsubstituted C_1 - C_6 alkyl and substituted or unsubstituted C_1 - C_6 heteroalkyl, or taken together, form $C(O)R^{18}$

wherein

R^{18} is a member selected from substituted or unsubstituted C_1 - C_6 alkyl and substituted or unsubstituted C_1 - C_6 heteroalkyl; and

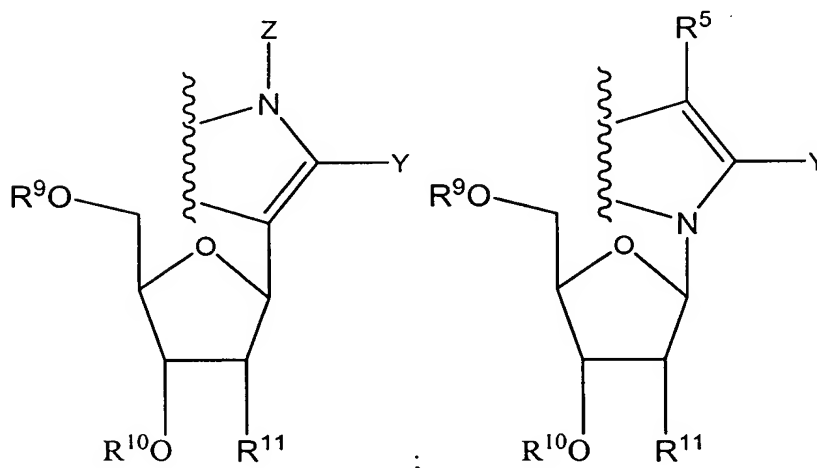
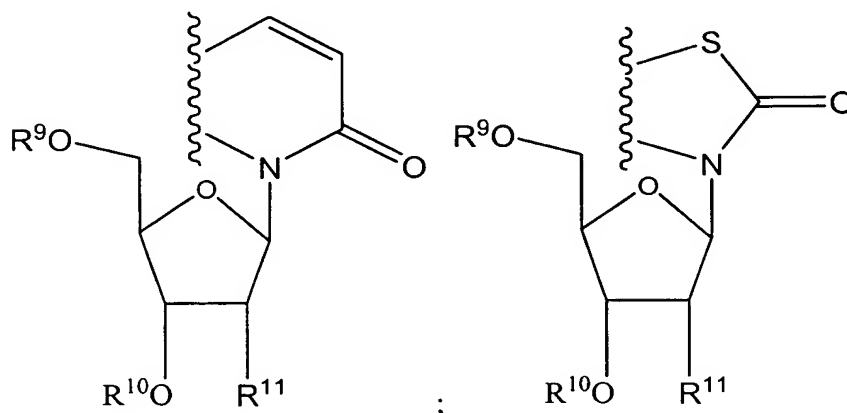
a pharmaceutically acceptable carrier.

14. A nucleic acid having a sequence comprising at least one moiety having the formula:



wherein

R^1 , R^2 and R^3 are members independently from H, substituted or unsubstituted alkyl, substituted or unsubstituted heteroalkyl, substituted or unsubstituted aryl, substituted or unsubstituted heteroaryl and substituted or unsubstituted heterocycloalkyl; and
ring system A is a member selected from:



wherein

Z is substituted or unsubstituted alkyl;

Y is a member selected from H, halogen, nitro, and nitroso;

R^5 is a member selected from H, CN, OR^{12} , $C(X^1)OR^{12}$,

$C(X^1)NR^{13}R^{14}$, $NR^{15}R^{16}$, SR^{12} , NO, halogen, substituted or unsubstituted C_1 - C_6 alkyl and substituted or unsubstituted C_1 - C_6 heteroalkyl

wherein

R¹² is a member selected from H, substituted or unsubstituted C₁-C₆ alkyl, substituted or unsubstituted C₁-C₆ heteroalkyl and C(O)R¹⁷

wherein

R¹⁷ is substituted or unsubstituted C₁-C₆ alkyl and substituted or unsubstituted C₁-C₆ heteroalkyl;

X¹ is a member selected from (=O), (=NH) and (=S);

R¹³ and R¹⁴ are members independently selected from H, substituted or unsubstituted C₁-C₆ alkyl and substituted or unsubstituted C₁-C₆ heteroalkyl; and

R¹⁵ and R¹⁶ are members independently selected from H, O, substituted or unsubstituted C₁-C₆ alkyl and substituted or unsubstituted C₁-C₆ heteroalkyl, or taken together, form C(O)R¹⁸

wherein

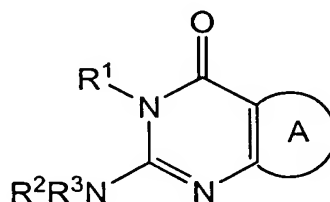
R¹⁸ is a member selected from substituted or unsubstituted C₁-C₆ alkyl and substituted or unsubstituted C₁-C₆ heteroalkyl;

R⁹ and R¹⁰ are members independently selected from H, and a nucleic acid; and

R¹¹ is a member selected from H, OH, and a nucleic acid.

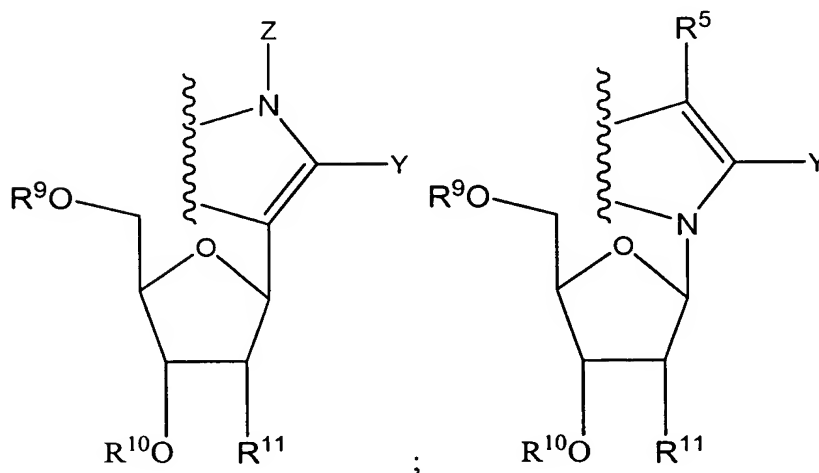
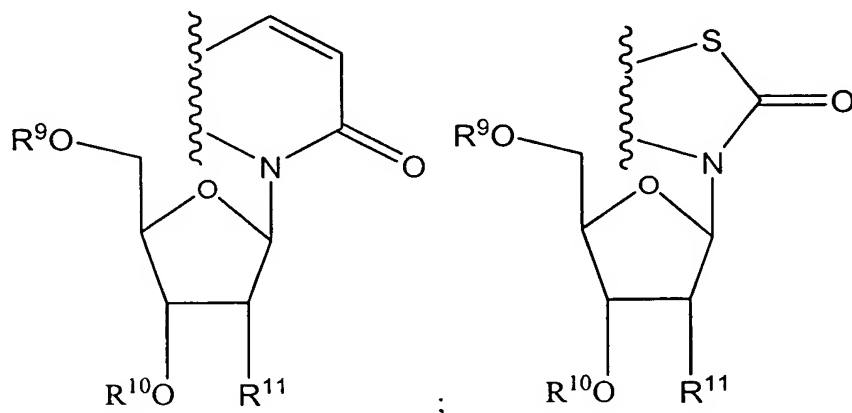
15. The nucleic acid sequence according to claim 14, having a CpG format.

16. A pharmaceutical composition comprising a nucleic acid having a sequence comprising at least one moiety having the formula:



wherein

R^1 , R^2 and R^3 are members independently from H, substituted or unsubstituted alkyl,
 substituted or unsubstituted heteroalkyl, substituted or unsubstituted aryl,
 substituted or unsubstituted heteroaryl and substituted or unsubstituted
 heterocycloalkyl; and
 ring system A is a member selected from:



wherein

Z is substituted or unsubstituted alkyl;

Y is a member selected from H, halogen, nitro, and nitroso;

R^5 is a member selected from H, CN, OR^{12} , $C(X^1)OR^{12}$,

$C(X^1)NR^{13}R^{14}$, $NR^{15}R^{16}$, SR^{12} , NO, halogen, substituted or
 unsubstituted C_1 - C_6 alkyl and substituted or unsubstituted C_1 -
 C_6 heteroalkyl

wherein

20 R^{12} is a member selected from H, substituted or unsubstituted
 21 C_1-C_6 alkyl, substituted or unsubstituted C_1-C_6
 22 heteroalkyl and $C(O)R^{17}$
 23 wherein
 24 R^{17} is substituted or unsubstituted C_1-C_6 alkyl and
 25 substituted or unsubstituted C_1-C_6 heteroalkyl;
 26 X^1 is a member selected from (=O), (=NH) and (=S);
 27 R^{13} and R^{14} are members independently selected from H,
 28 substituted or unsubstituted C_1-C_6 alkyl and substituted
 29 or unsubstituted C_1-C_6 heteroalkyl; and
 30 R^{15} and R^{16} are members independently selected from H, O,
 31 substituted or unsubstituted C_1-C_6 alkyl and substituted
 32 or unsubstituted C_1-C_6 heteroalkyl, or taken together,
 33 form $C(O)R^{18}$
 34 wherein
 35 R^{18} is a member selected from substituted or
 36 unsubstituted C_1-C_6 alkyl and substituted or
 37 unsubstituted C_1-C_6 heteroalkyl;
 38 R^9 and R^{10} are members independently selected from H, and a nucleic
 39 acid;
 40 R^{11} is a member selected from H, OH and a nucleic acid; and
 41 a pharmaceutically acceptable carrier.

1 **17.** A method of activating an immune system in a mammal in need of
 2 such activation, the method comprising administering to the mammal a therapeutically
 3 effective amount of a pharmaceutical composition, wherein the pharmaceutical composition
 4 comprises a nucleic acid of claim 14, wherein the nucleic acid comprises a toll-like receptor
 5 (TLR) ligand.

1 **18.** The method of claim 17, wherein the TLR ligand binds to a TLR
 2 expressed on an endosomal membrane.

1 **19.** The method of claim 17, wherein the composition further comprises a
 2 CpG oligonucleotide (ISS-ODN).

- 1 20. The method of claim 17, further comprising administration of an
2 IMPDH inhibitor.
- 1 21. The method of claim 17, wherein the composition is administered to a
2 mucus membrane.
- 1 22. The method of claim 17, wherein said TLR ligand is a homofunctional
2 TLR ligand polymer.
- 1 23. The method of claim 22, wherein the homofunctional TLR ligand
2 polymer comprises a TLR ligand selected from the group consisting of a TLR-7 ligand and a
3 TLR-8 ligand.
- 1 24. The method of claim 23, wherein the homofunctional TLR ligand
2 polymer comprises a TLR-7 ligand.
- 1 25. The method of claim 24, wherein the TLR-7 ligand is a member
2 selected from the group consisting of a 7-thia-8-oxoguanosinyl (TOG) moiety, a 7-
3 deazaguanosinyl (7DG) moiety, and an imiquimod moiety.
- 1 26. The method of claim 23, wherein the homofunctional TLR ligand
2 polymer comprises a TLR-8 ligand.
- 1 27. The method of claim 26, wherein the TLR-8 ligand is a resiquimod
2 moiety.
- 1 28. The method of claim 17, wherein said TLR ligand is a heterofunctional
2 TLR ligand polymer.
- 1 29. The method of claim 28, wherein said heterofunctional TLR ligand
2 polymer comprises a TLR-7 ligand and a member selected from the group consisting of a
3 TLR-8 ligand and a TLR-9 ligand.
- 1 30. The method of claim 28, wherein said heterofunctional TLR ligand
2 polymer comprises a TLR-7 ligand, a TLR-8 ligand, and a TLR-9 ligand.
- 1 31. The method of claim 28, wherein said heterofunctional TLR ligand
2 polymer comprises a TLR-8 ligand and a TLR-9 ligand.

1 **32.** A method of enhancing resistance to infection in a mammal in need of
2 such enhancement of resistance, the method comprising administering to the mammal a
3 therapeutically effective amount of a pharmaceutical composition, wherein the
4 pharmaceutical composition comprises a nucleic acid of claim **14**, wherein the nucleic acid
5 comprises a toll-like receptor (TLR) ligand.

1 **33.** The method of claim **32**, wherein the TLR ligand binds to a TLR
2 expressed on an endosomal membrane.

1 **34.** The method of claim **32**, wherein the composition further comprises a
2 CpG oligonucleotide (ISS-ODN).

1 **35.** The method of claim **32**, further comprising administration of an
2 IMPDH inhibitor.

1 **36.** The method of claim **32**, wherein the composition is administered to a
2 mucus membrane.

1 **37.** The method of claim **32**, wherein said TLR ligand is a homofunctional
2 TLR ligand polymer.

1 **38.** The method of claim **37**, wherein the homofunctional TLR ligand
2 polymer comprises a TLR ligand selected from the group consisting of a TLR-7 ligand and a
3 TLR-8 ligand.

1 **39.** The method of claim **38**, wherein said homofunctional TLR ligand
2 polymer comprises a TLR-7 ligand.

1 **40.** The method of claim **39**, wherein said TLR-7 ligand is a member
2 selected from the group consisting of a 7-thia-8-oxoguanosinyl (TOG) moiety, a 7-
3 deazaguanosinyl (7DG) moiety, and an imiquimod moiety.

1 **41.** The method of claim **38**, wherein the homofunctional TLR ligand
2 polymer comprises a TLR-8 ligand.

1 **42.** The method of claim **41**, wherein the TLR-8 ligand is a resiquimod
2 moiety.

1 **43.** The method of claim 32, wherein said TLR ligand is a heterofunctional
2 TLR ligand polymer.

1 **44.** The method of claim 43, wherein said heterofunctional TLR ligand
2 polymer comprises a TLR-7 ligand and a member selected from the group consisting of a
3 TLR-8 ligand and a TLR-9 ligand.

1 **45.** The method of claim 43, wherein said heterofunctional TLR ligand
2 polymer comprises a TLR-7 ligand, a TLR-8 ligand, and a TLR-9 ligand.

1 **46.** The method of claim 43, wherein said heterofunctional TLR ligand
2 polymer comprises a TLR-8 ligand and a TLR-9 ligand.

1 **47.** The method of claim 32, wherein the infection is caused by a virus.

1 **48.** The method of claim 47, wherein the virus is an interferon-sensitive
2 virus.

1 **49.** The method of claim 32, wherein the infection is caused by a bacteria.

1 **50.** The method of claim 49, wherein the bacteria causes an intracellular
2 bacterial infection.

1 **51.** The method of claim 49, wherein an antibiotic is also administered to
2 the mammal.

1 **52.** A method of treating a viral infection in a mammal in need of such
2 treatment, the method comprising administering a TLR ligand, and
3 administering an IMPDH inhibitor.

1 **53.** The method of claim 52, wherein the IMPDH inhibitor is mizoribine,
2 an enantiomer of mizoribine, mizoribine base, mizoribine aglycone, or a prodrug of such
3 compound.

1 **54.** The method of claim 52, wherein the viral infection is caused by an
2 RNA virus.

1 55. The method of claim 54, further comprising administering a synthetic
2 TLR ligand.

1 56. The method of claim 54, wherein the viral infection is caused by an
2 RNA virus selected from the group consisting of a coronavirus that causes Severe Acute
3 Respiratory Syndrome (SARS) and a Hepatitis C Virus.

1 57. The method of claim 54, wherein the RNA virus is mutated and does
2 not cause an induction of interferon synthesis.

1 58. The method of claim 54, wherein the IMPDH inhibitor is administered
2 directly to the site of viral infection.

1 59. The method of claim 58, wherein the RNA virus is a coronavirus that
2 causes SARS and the IMPDH inhibitor is administered to a lung.

1 60. The method of claim 52, wherein the viral infection is caused by a
2 DNA virus.

1 61. The method of claim 60, wherein the TLR ligand is a synthetic TLR
2 ligand.

1 62. The method of claim 60, wherein the DNA virus is a Hepatitis B virus.

1 63. The method of claim 60, wherein the IMPDH inhibitor is given
2 systemically.

1 64. A method for treating cancer comprising administering to a subject in
2 need of such treatment a therapeutically effective amount of
3 (a) a member selected from an inhibitor of inosine monophosphate
4 dehydrogenase (IMPDH), an enantiomer of such a compound, a prodrug of such a compound,
5 a pharmaceutically acceptable salt of such a compound, and combinations thereof; and
6 (b) an interferon inducer.

1 65. The method of claim 64, wherein the cancer is an interferon-sensitive
2 cancer.

1 **66.** The method of claim **65**, wherein the interferon-sensitive cancer is a
2 member selected from a leukemia, a lymphoma, a myeloma, a melanoma, and a renal cancer.

1 **67.** The method of claim **64**, wherein the IMPDH inhibitor is selected from
2 the group consisting of mizoribine, mizoribine base, mizoribine aglycone, mycophenolic
3 acid, mycophenolate mofetil, Tiazofurin and ribavirin.

1 **68.** The method of claim **64**, further comprising administration of
2 therapeutically effective amount of a Type I interferon.

1 **69.** The method of claim **64**, wherein the interferon inducer comprises a
2 therapeutically effective amount of a pharmaceutical composition, wherein the
3 pharmaceutical composition comprises a nucleic acid of claim **14**, wherein the nucleic acid
4 comprises a toll-like receptor (TLR) ligand.

1 **70.** The method of claim **69**, wherein the TLR ligand binds to a TLR
2 expressed on an endosomal membrane.

1 **71.** The method of claim **69**, wherein the composition further comprises a
2 CpG oligonucleotide (ISS-ODN).

1 **72.** The method of claim **69**, wherein the composition is administered to a
2 mucus membrane.

1 **73.** The method of claim **69**, wherein the TLR ligand is a homofunctional
2 TLR ligand polymer.

1 **74.** The method of claim **73**, wherein the homofunctional TLR ligand
2 polymer comprises a TLR ligand selected from the group consisting of a TLR-7 ligand and a
3 TLR-8 ligand.

1 **75.** The method of claim **74**, wherein said homofunctional TLR ligand
2 polymer comprises a TLR-7 ligand.

1 **76.** The method of claim **75**, wherein said TLR-7 ligand is a member
2 selected from the group consisting of a 7-thia-8-oxoguanosinyl (TOG) moiety, a 7-
3 deazaguanosinyl (7DG) moiety, and an imiquimod moiety.

- 1 **77.** The method of claim 74, wherein the homofunctional TLR ligand
2 polymer comprises a TLR-8 ligand.
- 1 **78.** The method of claim 77, wherein the TLR-8 ligand is a resiquimod
2 moiety.
- 1 **79.** The method of claim 69, wherein said TLR ligand is a heterofunctional
2 TLR ligand polymer.
- 1 **80.** The method of claim 79, wherein said heterofunctional TLR ligand
2 polymer comprises a TLR-7 ligand and a member selected from the group consisting of a
3 TLR-8 ligand and a TLR-9 ligand.
- 1 **81.** The method of claim 79, wherein said heterofunctional TLR ligand
2 polymer comprises a TLR-7 ligand, a TLR-8 ligand, and a TLR-9 ligand.
- 1 **82.** The method of claim 79, wherein said heterofunctional TLR ligand
2 polymer comprises a TLR-8 ligand and a TLR-9 ligand.
- 1 **83.** A method for treating an autoimmune disease comprising
2 administering to a subject in need of such treatment a therapeutically effective amount of
3 (a) a member selected from an inhibitor of inosine monophosphate
4 dehydrogenase (IMPDH), an enantiomer of such a compound, a prodrug of such a compound,
5 a pharmaceutically acceptable salt of such a compound, and combinations thereof; and
6 (b) an interferon inducer.
- 1 **84.** The method of claim 83, wherein the IMPDH inhibitor is selected from
2 the group consisting of mizoribine, mizoribine base, mizoribine aglycone, mycophenolic
3 acid, mycophenolate mofetil, Tiazofurin and ribavirin.
- 1 **85.** The method of claim 83, wherein the autoimmune disease is multiple
2 sclerosis.
- 1 **86.** The method of claim 83, further comprising administering a
2 therapeutically effective amount of a Type I interferon.

1 **87.** The method of claim **83**, wherein the interferon inducer comprises a
2 therapeutically effective amount of a pharmaceutical composition, wherein the
3 pharmaceutical composition comprises a nucleic acid of claim **14**, wherein the nucleic acid
4 comprises a toll-like receptor (TLR) ligand.

1 **88.** The method of claim **87**, wherein the TLR ligand binds to a TLR
2 expressed on an endosomal membrane.

1 **89.** The method of claim **87**, wherein the composition further comprises a
2 CpG oligonucleotide (ISS-ODN).

1 **90.** The method of claim **87**, wherein the composition is administered to a
2 mucus membrane.

1 **91.** The method of claim **87**, wherein said TLR ligand is a homofunctional
2 TLR ligand polymer.

1 **92.** The method of claim **91**, wherein the homofunctional TLR ligand
2 polymer comprises a TLR ligand selected from the group consisting of a TLR-7 ligand and a
3 TLR-8 ligand.

1 **93.** The method of claim **92**, wherein said homofunctional TLR ligand
2 polymer comprises a TLR-7 ligand.

1 **94.** The method of claim **93**, wherein said TLR-7 ligand is a member
2 selected from the group consisting of a 7-thia-8-oxoguanosinyl (TOG) moiety, a 7-
3 deazaguanosinyl (7DG) moiety, and an imiquimod moiety.

1 **95.** The method of claim **92**, wherein the homofunctional TLR ligand
2 polymer comprises a TLR-8 ligand.

1 **96.** The method of claim **95**, wherein the TLR-8 ligand is a resiquimod
2 moiety.

1 **97.** The method of claim **87**, wherein said TLR ligand is a heterofunctional
2 TLR ligand polymer.

1 **98.** The method of claim 97, wherein said heterofunctional TLR ligand
2 polymer comprises a TLR-7 ligand and a member selected from the group consisting of a
3 TLR-8 ligand and a TLR-9 ligand.

1 **99.** The method of claim 97, wherein said heterofunctional TLR ligand
2 polymer comprises a TLR-7 ligand, a TLR-8 ligand, and a TLR-9 ligand.

1 **100.** The method of claim 97, wherein said heterofunctional TLR ligand
2 polymer comprises a TLR-8 ligand and a TLR-9 ligand.

1 **101.** A method of treating a disease accessible to topical treatment in a
2 subject in need of such treatment comprising administering a therapeutically effective amount
3 of an interferon inducer, wherein said interferon inducer is given topically or delivered
4 directly to a diseased tissue; and
5 administering a therapeutically effective amount of a member selected from an
6 inhibitor of inosine monophosphate dehydrogenase (IMPDH), an enantiomer of such a
7 compound, a prodrug of such a compound, a pharmaceutically acceptable salt of such a
8 compound, and combinations thereof.

1 **102.** The method of claim 101, wherein the interferon inducer is a TLR
2 ligand.

1 **103.** The method of claim 102, wherein the TLR ligand is selected from the
2 group consisting of resiquimod, imiquimod, and ISS-ODN.

1 **104.** The method of claim 102, wherein the TLR ligand is a nucleic acid of
2 claim 14.

1 **105.** The method of claim 101, wherein the IMPDH inhibitor is
2 administered systemically.

1 **106.** The method of claim 101, wherein the IMPDH inhibitor is a member
2 selected from the group consisting of mizoribine, mizoribine base, and mizoribine aglycone.

1 **107.** The method of claim 101, wherein the disease accessible to topical
2 treatment is selected from the group consisting of cancer and precancerous conditions.

1 **108.** The method of claim **107**, wherein the cancer is selected from the
2 group consisting of melanoma, superficial bladder cancer, actinic keratoses, intraepithelial
3 neoplasia, and basal cell skin carcinoma.

1 **109.** The method of claim **107**, wherein the precancerous condition is
2 selected from the group consisting of actinic keratoses and intraepithelial neoplasia.

1 **110.** The method of claim **101**, wherein the disease accessible to topical
2 treatment is a viral disease.

1 **111.** The method of claim **110**, wherein the viral disease is a selected from
2 the group consisting of a human papilloma virus infection, a molluscum contagiosum, and a
3 herpes virus infection.

1 **112.** A method of treating cancer in a subject in need of such treatment
2 comprising administering a therapeutically effective amount of a member selected from
3 mizoribine, mizoribine base, mizoribine aglycone, an enantiomer of such a compound, a
4 prodrug of such a compound, a pharmaceutically acceptable salt of such a compound, and
5 combinations thereof; in combination with a therapeutically effective amount of Type I
6 interferon.

1 **113.** The method of claim **112**, wherein the cancer is a member selected
2 from a leukemia, a lymphoma, a myeloma, a melanoma, and a renal cancer.

1 **114.** A method of treating a viral infection in a subject in need of such
2 treatment comprising administering a therapeutically effective amount of a member selected
3 from mizoribine, mizoribine base, mizoribine aglycone, an enantiomer of such a compound, a
4 prodrug of such a compound, a pharmaceutically acceptable salt of such a compound, and
5 combinations thereof; in combination with a therapeutically effective amount of Type I
6 interferon.

1 **115.** The method of claim **114**, wherein the viral infection is caused by a
2 virus selected from the group consisting of a coronavirus that causes Severe Acute
3 Respiratory Syndrome (SARS), a Hepatitis B virus, and a Hepatitis C Virus.

1 **116.** A method of treating an autoimmune disease in a subject in need of
2 such treatment comprising administering a therapeutically effective amount of a member
3 selected from mizoribine, mizoribine base, mizoribine aglycone, an enantiomer of such a
4 compound, a prodrug of such a compound, a pharmaceutically acceptable salt of such a
5 compound, and combinations thereof; in combination with a therapeutically effective amount
6 of Type I interferon.

1 **117.** The method of claim 116, wherein the autoimmune disease is Multiple
2 Sclerosis.

1 **118.** A method of treating Crohn's Disease in a subject in need of such
2 treatment comprising administering a member selected from an inhibitor of inosine
3 monophosphate dehydrogenase (IMPDH), an enantiomer of such a compound, a prodrug of
4 such a compound, a pharmaceutically acceptable salt of such a compound, and combinations
5 thereof; and a member selected from the group consisting of probiotics and glycolipids.